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Human gene therapy and slippery slope arguments

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Abstract

Any suggestion of altering the genetic makeup of human beings through gene therapy is quite likely to provoke a response involving some reference to a 'slippery slope'. In this article the author examines the topography of two different types of slippery slope argument, the logical slippery slope and the rhetorical slippery slope argument. The logical form of the argument suggests that if we permit somatic cell gene therapy then we are committed to accepting germ line gene therapy in the future because there is no logically sustainable distinction between them. The rhetorical form posits that allowing somatic cell therapy now will be taking the first step on a slippery slope which will ultimately lead to the type of genocide perpetrated by the Nazis. The author tests the validity of these lines of argument against the facts of human gene therapy and concludes that because of their dependence on probabilities that cannot be empirically proven they should be largely disregarded in the much more important debate on moral line-drawing in gene therapy.

We can identify a number of reasons why discussions of gene therapy are particularly prone to the use of slippery slope rhetoric. Firstly, the technology currently offers one practical technique, somatic cell gene therapy, while scientists are on the threshold of developing others, such as germ line gene therapy, enhancement gene therapy and cosmetic gene therapy (1). The fact that these developments are on the horizon exposes the possibility that by accepting or allowing somatic cell gene therapy we may have to permit the other forms of gene therapy. A second factor explaining the prevalence of slippery slope arguments in the gene therapy debate is undoubtedly the historical link between eugenics and genetics. Perceptions of eugenics are still prevalent in society and are redolent with significance as Laberge and Knoppers have noted:

Key words

Legislation; ethics; jurisprudence; germ line gene therapy; somatic cell gene therapy.

'Within these "imaginaires populaires" of this new discipline are found the legacy of Mary Shelley's *Frankenstein* and George Orwell's *1984*. The Nazi experiment and the scientific and technological advances of the last decade have fuelled this public perception. The practice of genetic medicine finds itself therefore in an emotionally charged atmosphere' (2).

Thirdly, slippery slope arguments can carry greater force where the discussion centres on a topic which, because of its complexity and the use of genetic technology, is one of those categories of medicine which is perceived as being in some way potentially malevolent.

What is a slippery slope argument?

The basic structure of a slippery slope argument is fairly straightforward: 'If we allow somatic cell gene therapy now then germ line gene therapy may follow and since germ line gene therapy is morally unacceptable we should not begin by allowing somatic cell gene therapy'. The basic structure of the slippery slope argument has been outlined by Frederick Schauer:

'... regardless of the term employed, the phenomenon referred to is the same. The single argumentative claim ... is that a particular act, seemingly innocent when taken in isolation, may yet lead to a future host of similar but increasingly pernicious events' (3).

There are a number of characteristic components of a slippery slope argument whose presence should alert us to the type of argument being pursued as well as shedding some light on the nature of the argument itself. The first characteristic is described by Schauer as 'the implicit concession'. This is the point usually made at the outset of the argument that the instant case under consideration is itself quite innocuous. Analysis of the implications of gene therapy regularly start from the premise that somatic cell gene therapy is acceptable. LeRoy Walters has

identified 20 policy statements by eminent bodies which 'accept the moral legitimacy of somatic cell gene therapy for the cure of ... disease' (4).

The second characteristic of a slippery slope argument is that the two cases in question, the instant case and the undesirable danger case, can be separated from one another by some type of linguistic boundary. Somatic cell gene therapy can be linguistically distinguished from germ line gene therapy simply by describing how somatic cell therapy involves the treatment of one single individual, whereas the goal of germ line gene therapy is the permanent alteration of the germ line in order to prevent certain characteristics of disorders recurring in future generations.

A difficulty which nurtures these types of arguments is that of linguistic imprecision. Our capacity to express ourselves is finite. In order to attempt to draw a distinction between something as complex as somatic cell gene therapy and germ line gene therapy, the descriptions will necessarily be complex and technical, requiring both a degree of prior knowledge and interpretative skill. This difficulty can be exacerbated by the use of sloppy or vague language, which is sometimes deliberate. In law, it is not unusual for controversial legislation to be peppered with vague expressions which devolve the resolution of potentially divisive issues onto the judiciary and the courts.

Linguistic imprecision is, however, only part of the equation. Descriptions, whether they be of germ line gene therapy or the thirty-miles-per-hour speed limit must be interpreted. However, the message received is not always identical to the message sent, particularly if there has been a lapse in time. This is particularly true of legal interpretation, as Judge Cardozo noted:

'The half truths of one generation tend at times to perpetuate themselves in the law as the whole truths of another, when constant repetition brings it about that qualifications, taken once for granted are disregarded or forgotten' (5).

A final defining feature of a slippery slope argument is the increased risk of a calamitous conclusion brought about by permitting the instant case. It is a key feature of the slippery slope argument that the degree of risk will always be dramatically increased by permitting the first *prima facie* innocuous event. This is what makes the slope slippery, otherwise it would just be a normally treacherous incline. Having set out the parameters of the argument, the remainder of this discussion will focus on two particular versions of the slippery slope argument: the logical version and the rhetorical version.

The logical slippery slope

The logical form of the argument states that once we allow somatic cell gene therapy we are logically committed to accepting germ line gene therapy. Van der Burgh has argued that there are two different forms of the logical version of the argument (6). The first version would be based around the idea that since there is no relevant conceptual difference between somatic and germ line gene therapy there can be no reason to draw a line between them. This is because the arguments offered in favour of permitting somatic cell gene therapy can also be used in favour of permitting germ line gene therapy. Indeed, much of the current debate on whether germ line gene therapy should be allowed is based on exactly these lines. Those who think that germ line gene therapy should be permitted argue that somatic cell gene therapy has been sanctioned because it offers tremendous therapeutic potential for seriously ill people and therefore any risks can be overlooked. It is argued that germ line gene therapy offers exactly the same benefits but has additional attractions because somatic cell gene therapy will have to be repeated and the disorder may well be passed onto children. The attraction of germ line gene therapy is that it need only be done once and can eradicate the disease from future generations. Therefore, the argument runs, it is logical that germ line gene therapy will be allowed if somatic cell gene therapy is allowed and since germ line gene therapy is undesirable we should never permit the first step. This argument only has real force if we determine that germ line gene therapy is morally wrong. If we decide that there is no logical distinction to be made between somatic and germ line gene therapy and that germ line gene therapy is not morally troubling then it becomes much more difficult to justify drawing a line between them. It could be pointed out that what is being discussed here is not really a slippery slope at all, since there is a clear endpoint and only one step between it and the instant case. Perhaps it is more of a 'treacherous crevasse' argument.

Gradualism

The second form of the 'logical' slippery slope argument, is based on gradualism and can be summed up thus: 'Although there may be a clear conceptual difference between somatic cell gene therapy and germ line gene therapy, there is no such difference between somatic cell and cosmetic gene therapy, nor is there such a difference between cosmetic gene therapy and enhancement gene therapy and therefore we will ultimately accept that there is no real difference between this and germ line gene therapy'.

This argument basically claims that despite the fact that there may be a clear conceptual distinction between these two forms of genetic manipulation we will always end up accepting germ line gene therapy if we accept somatic cell therapy. This form of the argument can be persuasive where there are real problems finding clear non-arbitrary cut-off points.

These 'logical' slippery slope arguments have considerable force when we are discussing the morality of certain courses of action. However, when we come to consider law it becomes apparent that certain clear distinctions can be made. Law is an all-embracing term and the validity or strength of slippery slope arguments depends on whether we are referring to statutory laws or precedent (7). With unambiguous legislation logical slippery slope arguments may have little or no force. This is often illustrated by examples about speed limits. Although there is no practical or morally significant difference between thirty miles per hour and thirty-one miles per hour this does not mean that the speed limit will, or should, become thirty-one miles per hour. It is the power of law in such contexts to impose with moral force the type of arbitrary cut-off points which lack cogency in moral argument. A logical slippery slope argument can therefore be seen to have relatively little force in the context of legislation.

Judge-made case law, or precedent, is rather more vulnerable to slippery slope claims than legislation. Firstly, the whole process of adjudication in many ways involves and resembles critical moral reasoning and so slippery slope arguments can have more force (8). Secondly, the nature of the rules of precedent are such that they impel many judges to decide cases within a narrowly circumscribed framework dictated by previous decisions. Thus there is much less scope for them to legislate and set clear and arbitrary limits. Similarly judges may feel constrained from setting such limits because to do so would be a 'naked usurpation of the function of the legislature' (9). There are constitutional reasons why judges are less likely to impose clear limits and case law is therefore more likely to be influenced by logical slippery slope arguments.

This feature is exacerbated by the nature of adjudication in a precedent-based legal system. Cases are decided in a step by step manner, and while there are no sudden variations in the law, incremental change does come about through the development of existing precedents. Thus the second type of logical slippery slope argument may have some force in relation to judge-made law. The problem is complicated by the fact that it is difficult to make reasonable and enforceable distinctions in judge-made law. In legislation such distinctions can be made and enforced on what appear to be flimsy and illogical grounds (10). Another reason why law seems vulnerable to slippery slope arguments is because of its historical nature. Both in the development of the common law and in the drafting of legislation, there tends to be an awareness of what has gone before as well as a desire to provide for the future (11).

Rhetorical slippery slopes

The rhetorical slippery slope arguments are presented as the other half of a dichotomous family of arguments. However, the taxonomy does not fit perfectly and the increasing use of the term 'psychological' to describe this particular variety of argument may have as much to do with a desire for verbal tidiness as it does with philosophical integrity.

This form of the slippery slope argument tends to be most commonly used in popular discourse. Thus it is not uncommon, in discussions on topics such as euthanasia or abortion, to hear claims that if we allow the legalisation of mercy killing of individuals in terminal and intractable pain we will be taking the first step towards the type of genocide perpetrated by the Nazis. The exact process which could lead from allowing defences of mercy killing to Nazi-style genocide is rarely explicitly sketched out, but the argument undoubtedly had great rhetorical force.

The case of euthanasia in the Netherlands has been suggested as an example of such a slippery slope in action (12). Since the early 1970s the practice of euthanasia has become an established part of Dutch medical practice. Euthanasia was not legalised as such but a practice had grown up whereby doctors who performed so-called 'mercy killings' were unlikely to be prosecuted under the Dutch criminal law. In January 1994, after two decades of turning something of a blind eye to the practice of euthanasia (13) the Dutch legislature introduced legislation which without legalising euthanasia, brought certain constraints into play. A doctor is now obliged to report his actions to the state prosecutor in each case of 'mercy killing' so that an investigation can be carried out to determine if charges should be brought against the doctor under the criminal law. The Dutch euthanasia experience seems to illustrate the point that although there may often be a low friction gradient involved in issues like this, it is just as possible that law and morality may stop the downwards slide at a clearly defined point, or may even initiate a movement back up the slope by concretising in legislative form the way in which the practice is sanctioned.

The practice of euthanasia in the Netherlands has evolved from an *ad hoc* situation whereby doctors carried out life-shortening treatments following medical society guidelines (14) to one where the practice of euthanasia is explicitly prohibited by law except in cases where the doctor is adjudged by the state to have carried out a 'mercy killing' within statutory guidelines. As well as illustrating that it is possible to slip both up and down slopes, the Dutch experience demonstrates the importance of attention to detail in the language used to present a slippery slope argument. Typically, the formulation runs along such lines as: 'If we allow A then we will inevitably have a situation where B is also allowed'. This argument belies the subtleties of law-making and the scope of the variations which are available to legislators. The Dutch legislators never 'allowed' euthanasia in the free and unrestricted sense which critics now suggest, rather the practice grew up

because in that particular society a consensus developed around the idea that it was morally appropriate to hasten death in certain circumstances. This was never officially sanctioned by the legislature. The absolute prohibition on killing remained an unshakeable principle of the criminal law.

Is there a slippery slope in gene therapy?

The argument usually begins with the premise 'by allowing somatic cell gene therapy ...' or 'if we allow somatic cell gene therapy ...'. It is important to consider this first clause of the slippery slope claim. Firstly, what is meant by the word 'we'? This raises the question as to who could possibly have the power to sanction the beginning of such a process. Commonly in this type of argument the 'we' is intended to be society, the electorate, the general public, or some other community body. Yet in reality such groups rarely have the power or the inclination to get involved in determinations of the permissibility or acceptability of practices such as gene therapy. Although rhetorically, the 'we' seems to refer to society, in reality, at least in the UK context the 'we' is more likely to refer to a select committee or quango (15). Secondly, the question arises as to what is meant by 'allowed'. As far as legislation is concerned, the structure of legislation is such, particularly in a country with no written constitution, that the idea of something being 'allowed' is somewhat alien. Our law rarely addresses the question of allowing practices, rather it more commonly tends to concern itself with establishing exceptions to blanket prohibitions. Even laws which are considered by many to be liberal, such as the Abortion Act 1967, do not in fact allow abortion but rather provide a defence to a criminal charge (16). The same principle applies to almost everything that is sanctioned by the legislature. Parliament did not allow homosexual activity for men aged 18 and over, rather it modified the existing criminal law which made buggery an offence if it took place with someone under 21 years old. This is in keeping with our constitutional system of residual rights. It is somewhat inaccurate to talk about allowing certain types of activity, because most legislation regulates by drawing up exceptions to general prohibitions.

What then is the situation in relation to gene therapy? Again the question does not arise here of allowing certain types of gene therapy. In the United Kingdom the issue has been referred to a committee of experts, the Clothier committee, which has made certain recommendations which will now be implemented by the GTAC (Gene Therapy Advisory Committee). The Clothier Committee determined that a clear line could be drawn between germ line gene therapy and somatic cell gene therapy. It did not, however, simply decide to 'allow' somatic cell gene therapy, rather the report in fact states:

'The development and introduction of safe and effective means of gene modification for this purpose is a proper goal for medical science. We therefore recommend that the necessary research continue' (17).

So the issue is clearly not one of simply allowing somatic cell gene therapy, but rather of regulating it. The Clothier Committee has decided that research into gene therapy should be allowed to continue. This decision has been supported by the setting up of the GTAC to supervise and determine what types of gene therapy research are to be permitted. This committee's terms of reference include:

'To consider and advise on the acceptability of proposals for gene therapy research on human subjects, on ethical grounds, taking account of the scientific merits of the proposals and the potential benefits and risks' (18).

The Gene Therapy Advisory Committee is a permanent regulatory body adjudicating research proposals for gene therapy. It is apparent that we are a very long way indeed from a scenario where scientists are given a free hand to carry out somatic cell gene therapy on patients. Indeed, by July 1994 a total of eight gene therapy research protocols had received outline approval from the GTAC and three more are pending. In circumstances where the slippery slope argument is used and where it has considerable rhetorical force, very often the first premise of the argument ('if we allow A then') is overly simplistic and flawed and a thorough examination of what is being sanctioned will indicate that there is little danger of slithering down a slippery slope.

Gene therapy and the logical slippery slope

There are two different forms of the logical slippery slope argument. The first logical form of the slippery slope argument might claim that 'if the Gene Therapy Advisory Committee prohibits somatic cell gene therapy except in carefully controlled research projects we will be taking the first step that may lead to germ line gene therapy because there is no logical distinction to be made between the two'. It is apparent from this formulation that the argument is already being weakened by the checks and balances put in place by such a system of regulation.

What then of the claim that research in somatic cell gene therapy will inevitably lead to germ line modification because there is no conceptual difference between the two? In fact there would appear to be a clear conceptual, as well as linguistic, difference between somatic cell gene therapy and germ line gene therapy. Somatic cell therapy involves manipulation of the DNA in the ordinary cells of the

body which are then replaced by mechanical means such as injection or the use of an inhaler. If the recombinant DNA aspect of the procedure was not involved then there would be no difference between somatic cell gene therapy and the type of autologous bone marrow transplant which seems to have passed the test of acceptability.

Germ line gene therapy on the other hand is conceptually different. Whereas *ex vivo* and *in vivo* somatic gene therapy involve treatment of normal body cells, germ line gene therapy involves manipulation of the DNA of reproductive cells, the objective being that such modification will benefit not just the patient but also the children of that patient. The major conceptual difference between the two techniques is the intergenerational potential of germ line gene therapy. This clear distinction made the task of the Clothier Committee much easier. Science and nature rarely provide us with such clear non-arbitrary points at which to draw a bright line. Clothier wrote:

'The purpose of gene modification of sperm or ova or cells which produce them would be to prevent the transmission of defective genes to subsequent generations. Gene modification at an early stage of embryonic development, before differentiation of the germ line, might be a way of correcting gene defects in both the germ line and somatic cells. However, we share the view therefore that there is at present insufficient knowledge to evaluate the risks to future generations .... We recommend, therefore, that gene modification of the germ line should not yet be attempted' (19).

So the first logical form of the slippery slope argument does not seem to apply. What then of the second form of the argument? This argument would be primarily based on gradualism, the idea that although there may be a coherent distinction to be made between germ line gene therapy and somatic cell gene therapy there are many intermediate categories where such a distinction cannot so readily be made. This argument is largely inapplicable in the current context. In fact there is no intermediate category between somatic cell and germ line gene therapy. Currently somatic cell intervention is feasible, but only just. Germ line gene therapy in human beings is still some years away.

Both the logical forms of the slippery slope arguments are based around arguments about whether or not a clear distinction can be drawn between the two categories of gene therapy. I have argued that such a clear conceptual difference can be drawn. This seriously weakens the first form of the argument although it does not particularly affect the second form of the argument. The last vestiges of force in both lie in the proposition that it would be morally unacceptable to allow germ line gene therapy (20). In conclusion, both logical forms of the argument begin with a simplistic vision of the regulatory mechanisms already in place to scrutinise genetic manipulations. They are further weakened by the fact that gene therapy is a rare incidence of scientific enterprise which lends itself spectacularly well to the drawing of bright non-arbitrary lines. Finally they both present an unchallenged but extremely challengeable assumption that the acceptance of germ line gene therapy would be morally abhorrent.

Gene therapy and rhetorical slippery slopes

The cogency of rhetorical slippery slope arguments in relation to gene therapy owes much to past links between genetics and the eugenics movement. Modern genetics need not necessarily have anything to do with eugenics although the motives of individual scientists and research teams are difficult to police. A rhetorical slippery slope argument might take the following form: 'If the Gene Therapy Advisory Committee prohibits somatic cell gene therapy except where there is a clearly defined and approved research project then we will have taken the first step on a slippery slope towards the type of genocide perpetrated by the Nazis'.

Such an argument derives its power from its appeal to facts and probabilities which it would be pointless to try empirically to prove. It is impossible to determine whether a liberal attitude towards somatic cell gene therapy will ultimately result in a return to Nazi atrocities, but those who propose this viewpoint are not particularly concerned about that. The strength of their position is determined by the fact that it is enough simply to raise the possibility that a liberal attitude to human gene therapy could lead ultimately to Nazi-style atrocities.

There is one further reason why the rhetorical slippery slope argument has little application in relation to gene therapy. I have argued above that the rhetorical argument does have some merit in a legal context. However, the crucial distinction was that the rhetorical slippery slope argument only has force in relation to precedent and not in relation to legislation. Gene therapy, although not subject to statutory regulation as yet, is unlikely to be an issue which will come before the courts. Its regulation is overseen by the Gene Therapy Advisory Committee which, although an adjudicatory body in some senses, is not a precedent-bound hierarchical system and thus cannot be susceptible to the same type of rhetorical slippery slopes as the court system.

Conclusion

Slippery slope arguments present only one facet of the debate on the acceptability of the various types of gene therapy, but their rhetorical force can obscure the arguments' obvious philosophical flaws. Detailed analysis of the weakness of slippery slope claims

should help to displace such claims from their prominent position in ethical debates and allow attention to be focused on the demanding and important aspects of moral line-drawing in the new genetic technologies.

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References and notes

(1) The first patent application for a germ line gene therapy technique was made to the European Patent Office earlier this year. See: Coghlan A. 'Outrage greets patient on designer sperm'. *New scientist* 1994 Apr 9 and, anonymous. Patents for eugenics [editorial]. *Nature* 1994; 368: 572.

(2) Laberge C M, Knoppers B M. Rationale for an integrated approach to genetic epidemiology. *Bioethics* 1992; 6: 317.

(3) Schauer F. Slippery slopes. *Harvard law review* 1985; 99: 361–383.

(4) Walters L. Human gene therapy: ethics and public policy. *Human gene therapy* 1991; 2: 115. See also The Clothier Report. *Report of the Committee on the Ethics of Gene Therapy.* London: HMSO, 1992: CM 1788.

(5) *Allegheny College v National Chautauqua County Bank,* 246 NY 369, 373, 159 NE (1927).

(6) Van der Burgh W. The slippery slope argument. *The journal of clinical ethics* 1992; 3: 256–268.

(7) The slippery slope argument is particularly popular in English case law. A *LEXIS* search of the phrases 'slippery slope' and 'thin end of the wedge' produced one hundred cases where these were used in the judgment. For some reason the majority of these cases (53) involved planning disputes; whilst only one involved an actual slippery slope; *Horne v RAC Motor Sports Association Ltd* (unreported) (motor sport accident).

(8) This is particularly true in medico-legal adjudication. In such litigation slippery slope arguments often explicitly appear, although usually only to be discounted by the judges. See *Airedale NHS Trust v Bland* [1993] 1 All ER 821: 'I wish to add that I was unable to accept his suggestion that recent decisions show that the law is proceeding down a "slippery slope" in the sense that the courts are becoming more and more ready to allow doctors to take steps which will result in the ending of life.'

(9) *Magor and St Mellons Rural District Council v Newport Corporation* [1952] AC 189: 'It appear to me to be a naked usurpation of the legislative function under the thin disguise of interpretation and it is the less justifiable when it is guesswork with what material the legislature would, had it discerned the gap, filled it in.'

(10) For an illustration of a legislative distinction which many regard as indefensible, see the arguments in relation to the lowering of the homosexual age of consent to 16. Parliament decided on 21 February 1994 to preserve inequality in the age of consent amongst homosexuals by lowering it to 18, whereas the heterosexual age of consent remains 16.

(11) See reference (3): 383 where Schauer argues that 'the prevalence of slippery slope arguments in law may reflect a societal understanding that proceeding through law rather than in some other fashion involves being bound in some important way to the past, and responsible in some equally important way to the future'.

(12) Keown J. The law and practice of euthanasia in the Netherlands. *The law quarterly review* 1992; 108: 51–78. Keown notes at 77: 'The significance of the Dutch euthanasia experience for law, medicine and social policy in other countries is considerable, not least in respect of the support it lends to the "slippery slope" argument.' See also Gomez C F. *Regulating death: euthanasia and the case of the Netherlands.* New York: Macmillan, 1991; Nadeau R. *Euthanasia: charting the legal trends in Canada, the United States and the Netherlands.* Toronto: Human Life Research Institute, 1990.

(13) Van der Maas P J. Euthanasia and other medical decisions concerning the end of life. *Lancet* 1991; 338: 669–674. A 1991 study estimated that Dutch doctors perform euthanasia at the request of the patient around 2,300 times per year, that they also end the lives of 1,000 patients who are unable to make a request, and that they assist in around 400 suicides. In 35 per cent of cases death was caused by high doses of painkillers or by decisions not to treat. One point eight per cent of deaths were caused by the active administration of a lethal injection. Sixty-two per cent of GPs were found to have practised euthanasia at the request of a patient. See Remmelink Commission. *Report of the Commission of Inquiry into Medical Practice with Regard to Euthanasia,* the Hague, 1991.

(14) Royal Dutch Medical Association: central committee. *Vision on euthanasia,* 1986.

(15) As far as gene therapy is concerned the issue was determined initially by the Clothier committee on gene therapy which reported in 1992. Cm 1788. *Report of the Committee on the Ethics of Gene Therapy.* Since November 1993 this area has been regulated by the Gene Therapy Advisory Committee (GTAC) a permanent body with sixteen members, chaired by Professor Dame June Lloyd.

(16) Sections 58 and 59 of the Offences Against the Person Act 1861 make it an offence unlawfully to procure a miscarriage. What the 1967 Abortion Act, as amended by the 1990 Human Fertilisation and Embryology Act, does, is to provide a defence to a doctor who procures a miscarriage where he complies with one of four sets of conditions.

(17) See reference (4): *The Clothier report* at 8.4.

(18) Department of Health press release, 1993 Nov 15.

(19) See reference (4): *The Clothier report* at 5.1.

(20) Zimmerman B K. Human germ line gene therapy: the case for its development and use. *Journal of medicine and philosophy* 1991; 16: 593.